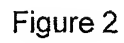


Figure 1



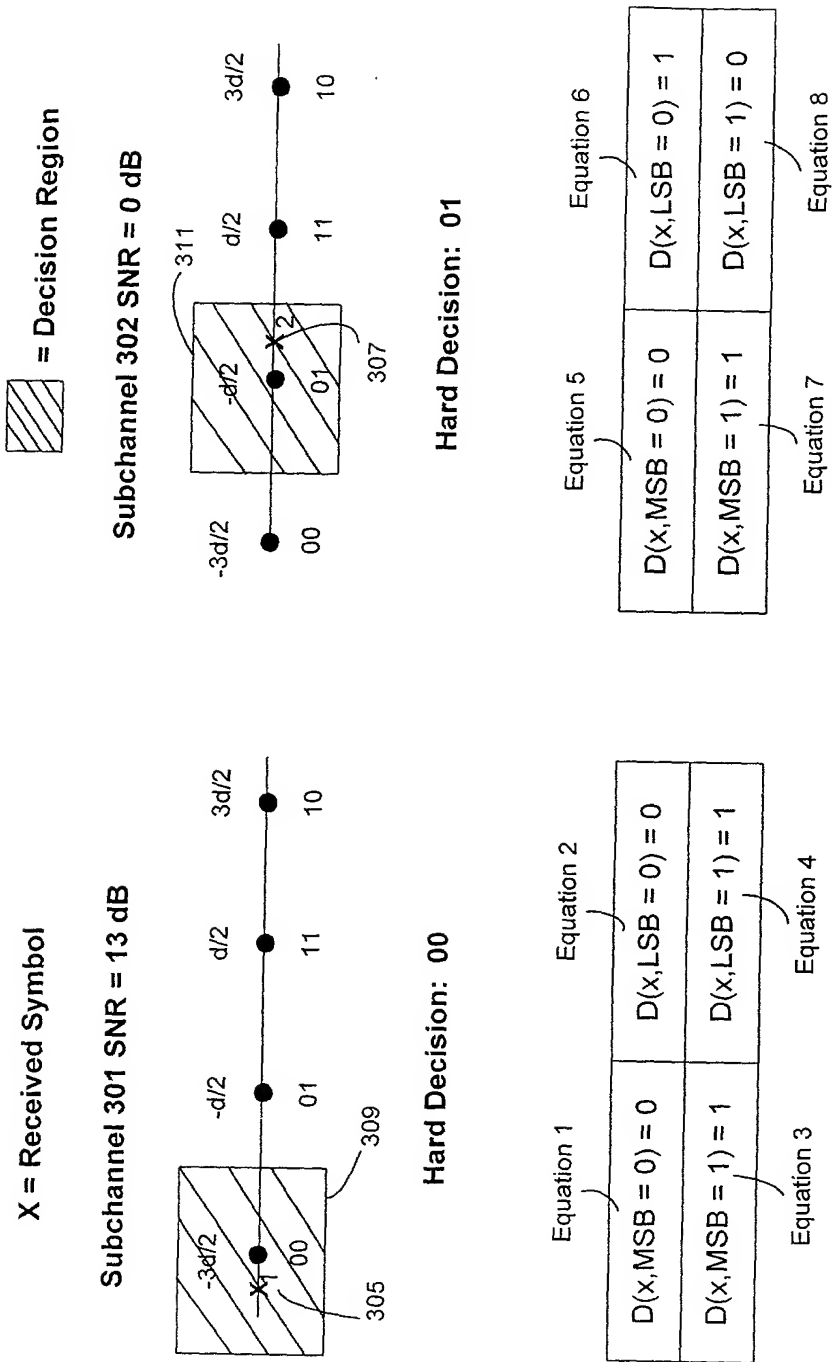


Figure 3

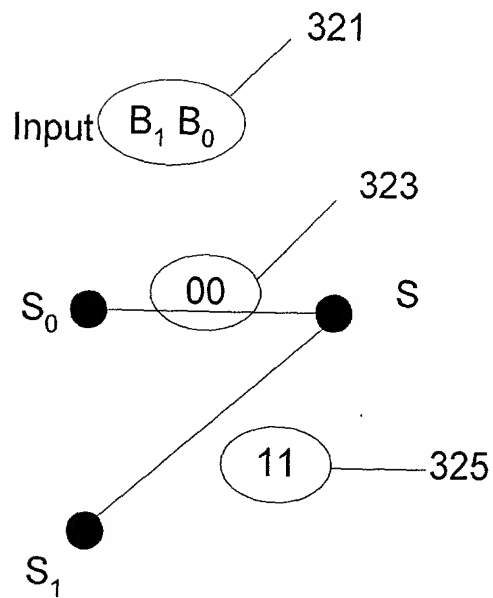


Figure 3A

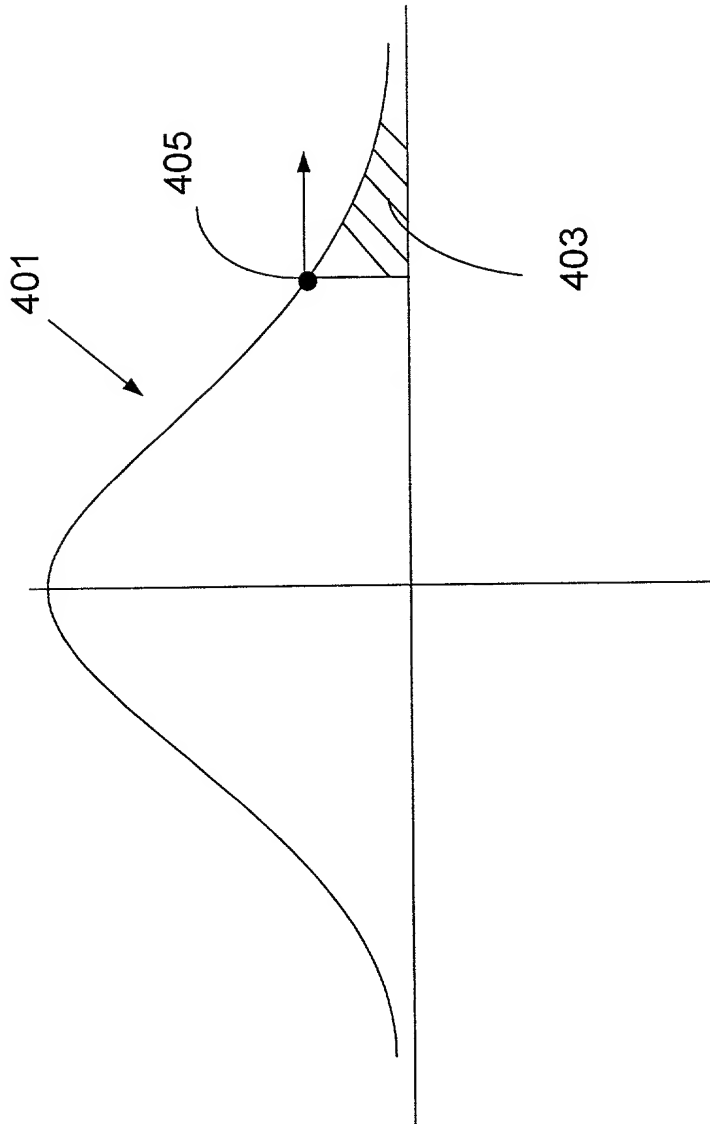
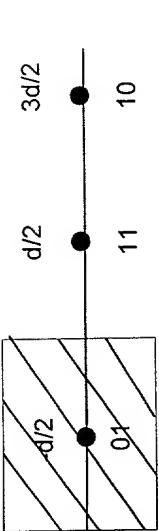
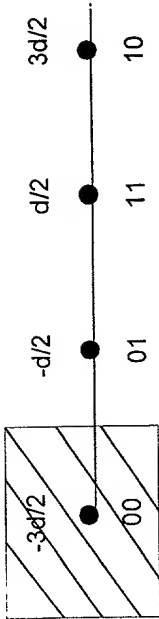


Figure 4

Subchannel 302 SNR = 0 dB



Subchannel 301 SNR = 13 dB



$N_Q = 3$ bits

Equation 1A

$D(x, MSB = 0) = 0$	$D(x, LSB = 0) = 0$
$D(x, MSB = 1) = 4$	$D(x, LSB = 1) = 4$

Equation 3A

Equation 2A

Equation 4A

Equation 5A

$D(x, MSB = 0) = 0$	$D(x, LSB = 0) = 1$
$D(x, MSB = 1) = 1$	$D(x, LSB = 1) = 0$

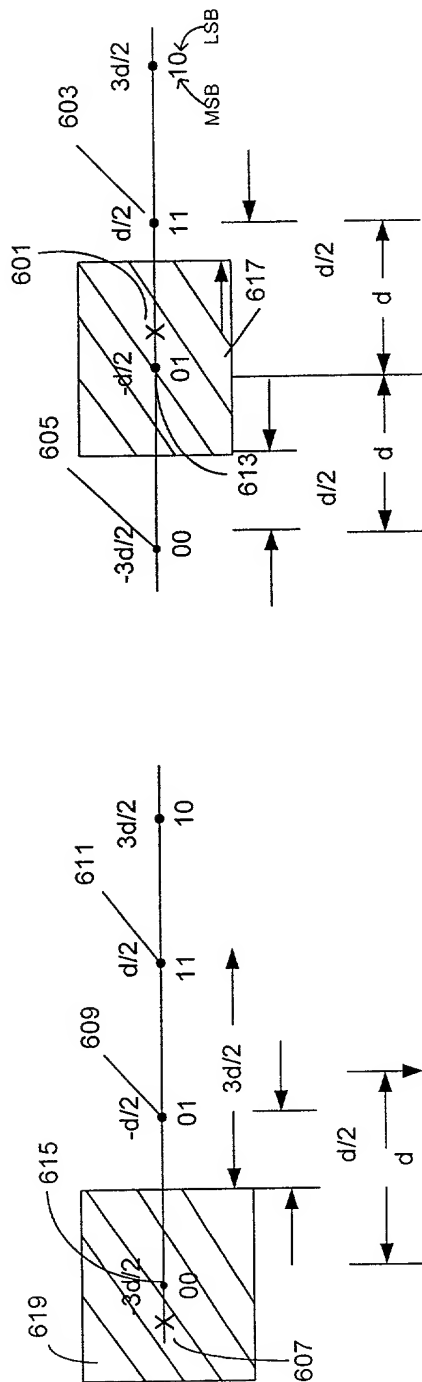
Equation 7A

Equation 8A

Figure 5

Subchannel 302 SNR = 0 dB

Subchannel 301 SNR = 13 dB


$$N^Q = 3 \text{ bits}$$

Equation 6B

Equation 5B

Equation 1B
Equation 2B

$D(x, MSB = 0) = 0$	$D(x, LSB = 0) = 1$
$D(x, MSB = 1) = 1$	$D(x, LSB = 1) = 0$

$D(x, \text{MSB} = 0) = 0$	$D(x, \text{LSB} = 0) = 0$
$D(x, \text{MSB} = 1) = 7$	$D(x, \text{LSB} = 1) = 4$

Equation 8B

Equation 7B

Equation 3B

Figure 6

16 QAM

Hard Decision	k_{MSB}	k_{LSB}
00	3	1
01	1	1
11	1	1
10	3	1

703

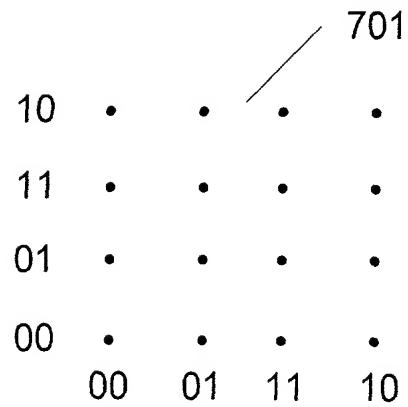


Figure 7

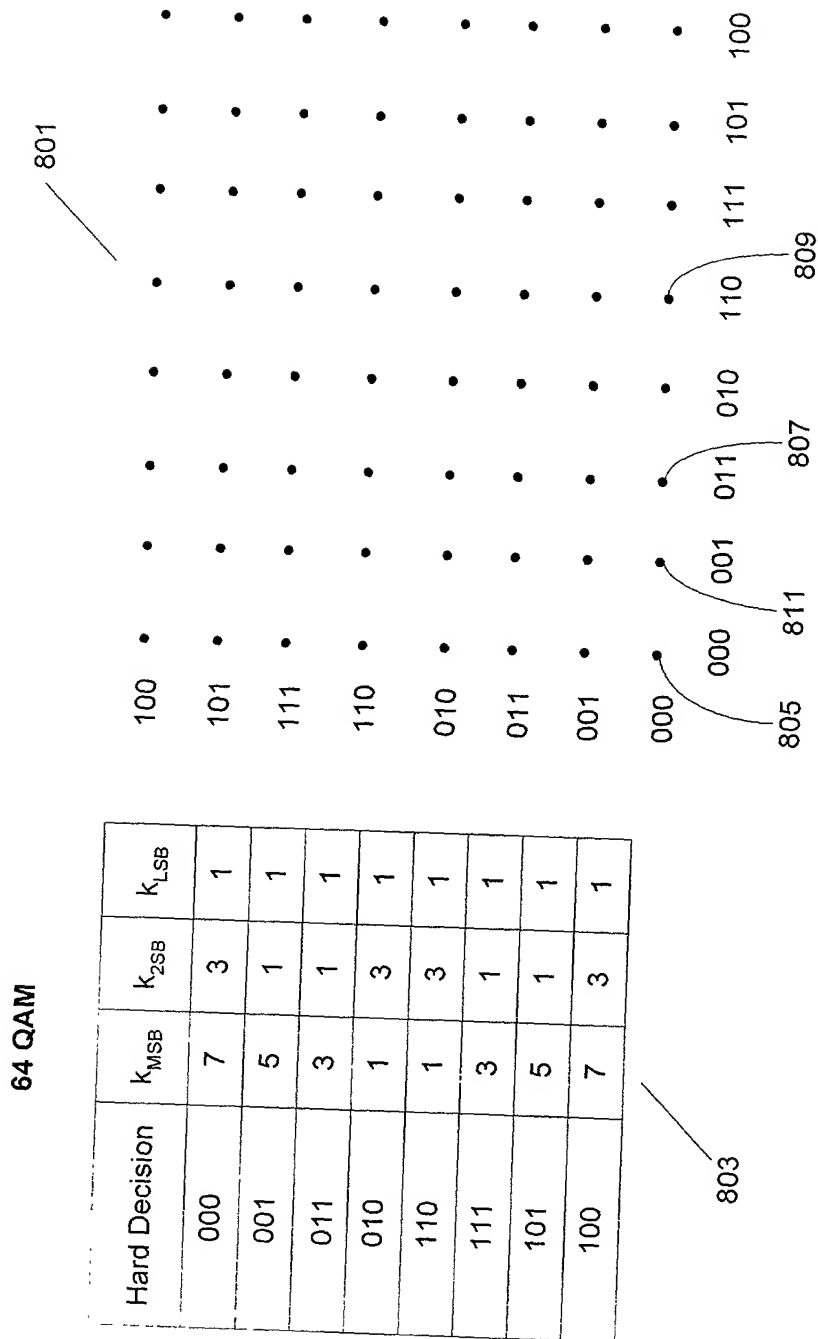


Figure 8

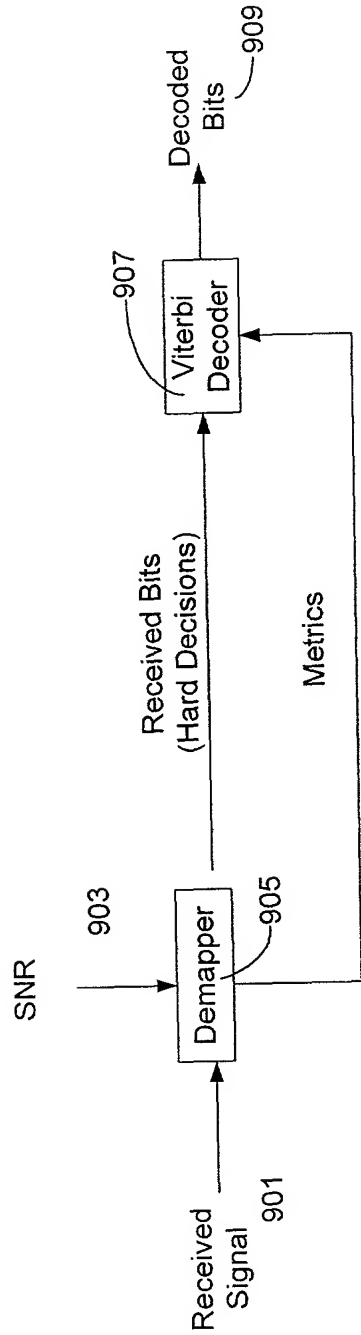


Figure 9

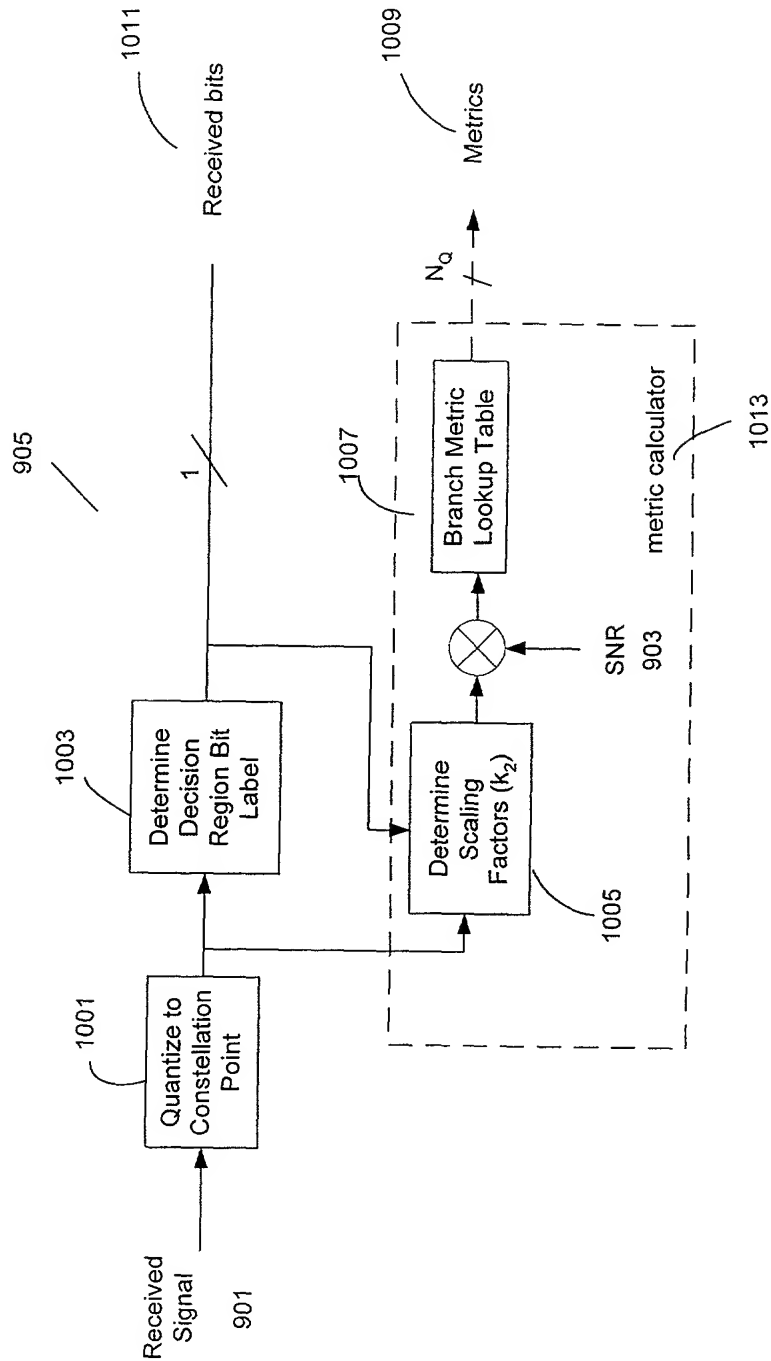


Figure 10

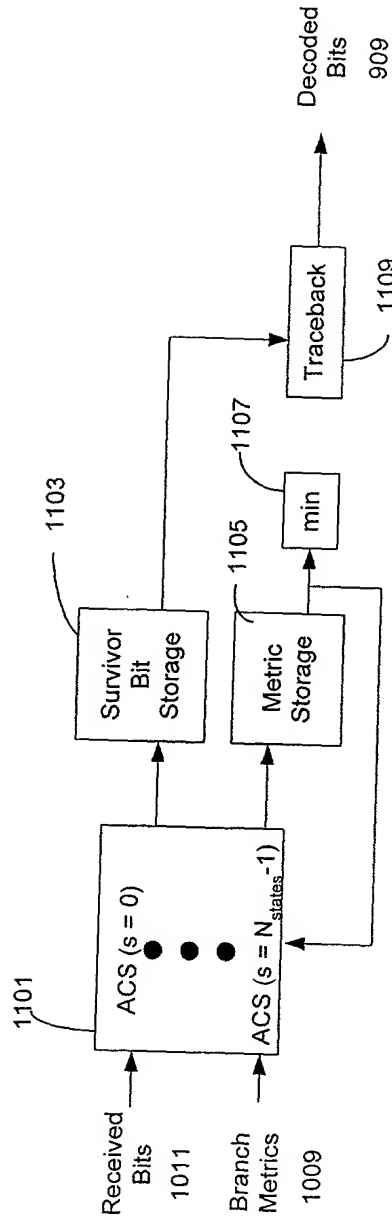


Figure 11

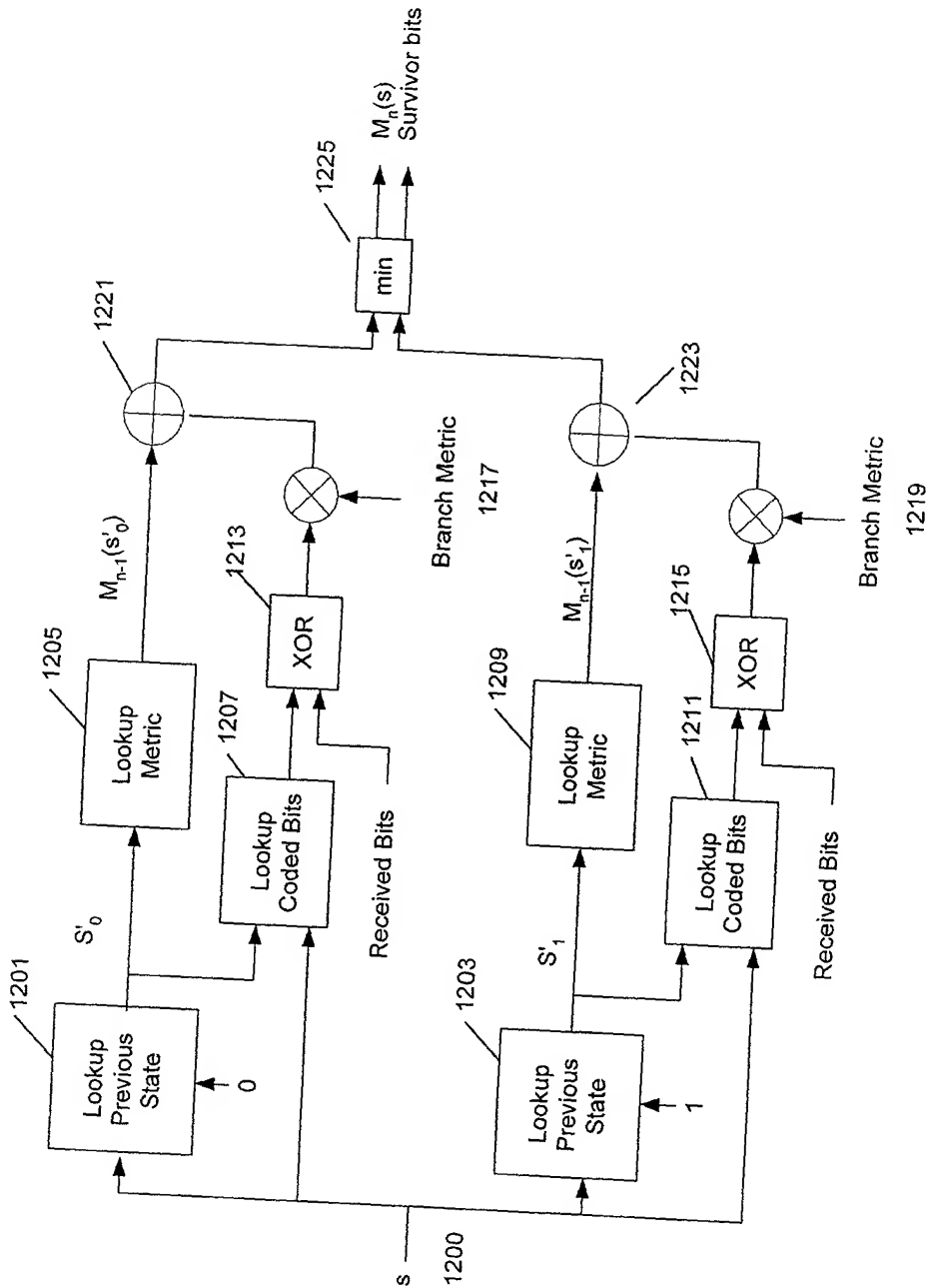


Figure 12

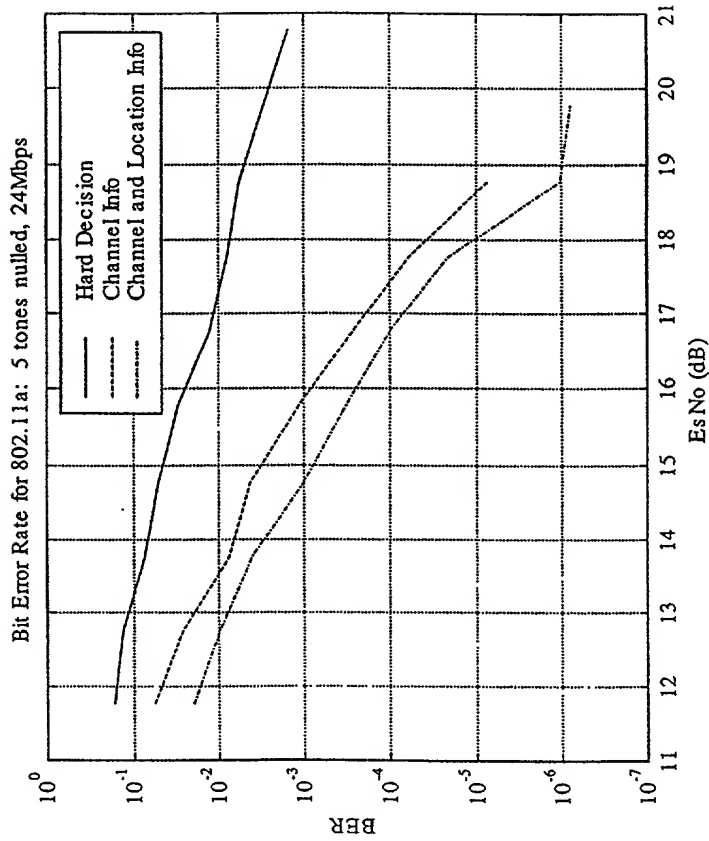


Figure 13A

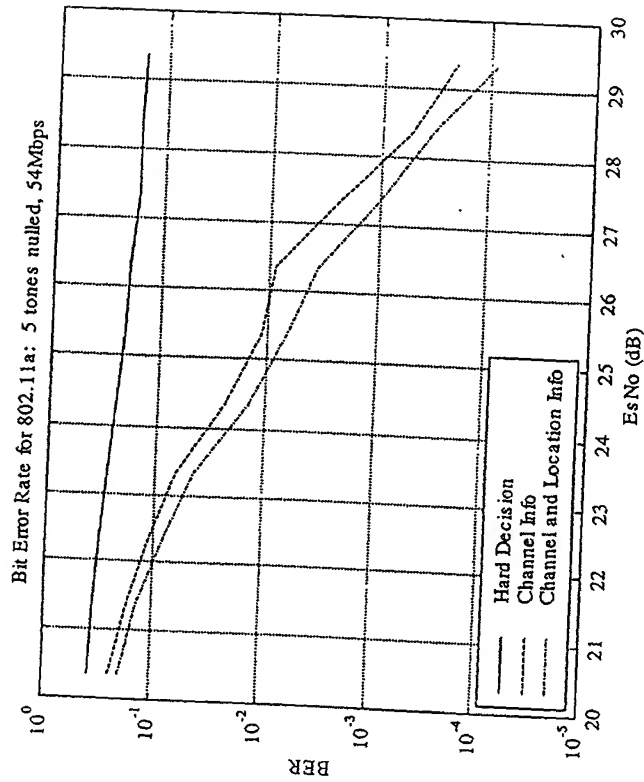


Figure 13B

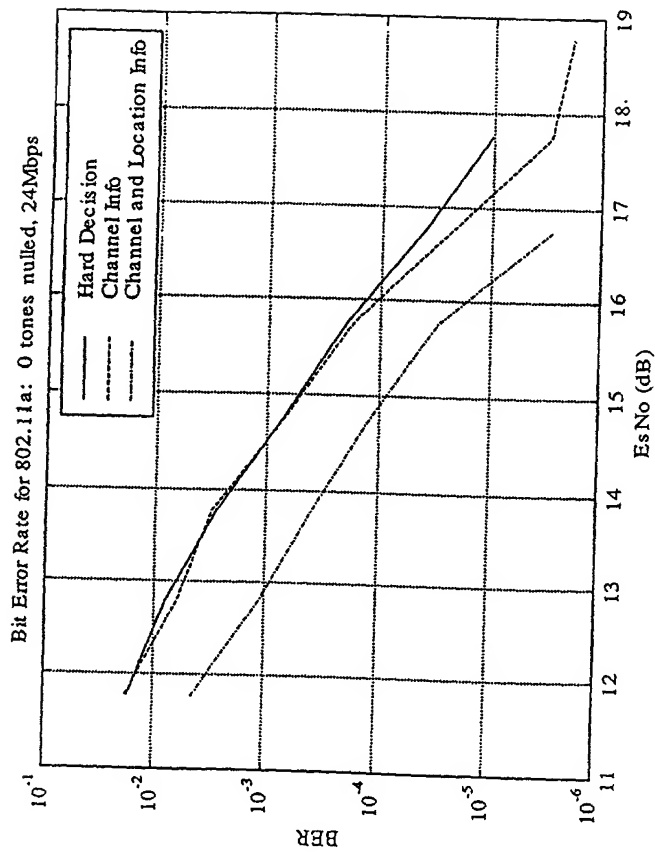


Figure 13C

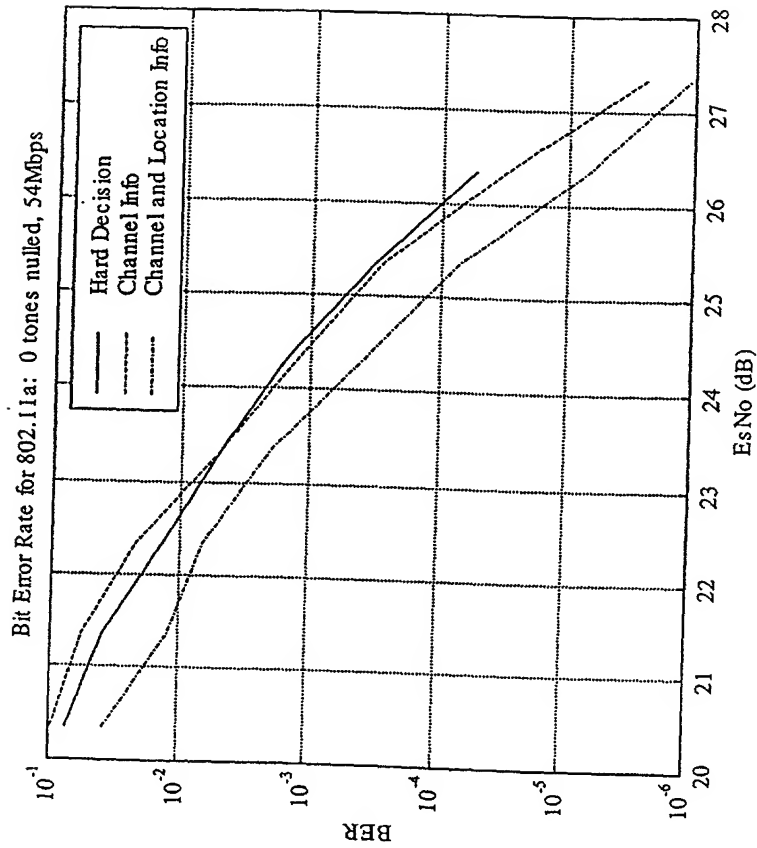


Figure 13D